

Portable Sensor for Rapid In Situ Measurement of Trace Toxic Metals in Water, Phase II

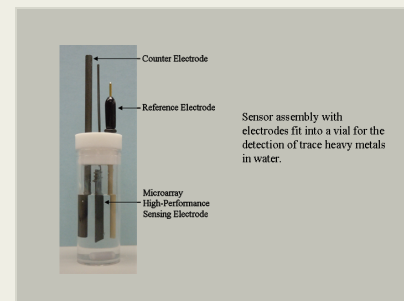
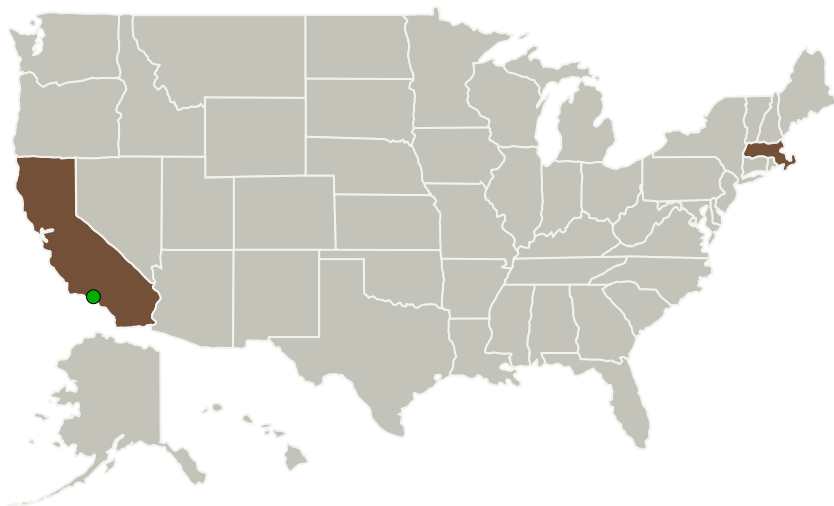
Completed Technology Project (2012 - 2015)



Project Introduction

Development of a sensor to detect select trace toxic heavy metals (Ag, Cd, Mn, Ni, and Zn) in water is proposed. Using an automatic side-stream sampling technique, this compact, electrochemical sensor will use small volumes of water and detect metals in the low parts-per-billion range. The novel coupling of a high-performance novel electrode material, microarray electrode geometry, and a highly sensitive sensing algorithm allows for a sensor with low detection limits and excellent specificity. Additionally, the sensor will show long-term repeatability and reliability, while requiring minimal maintenance or user calibration time. The sensor and its components have been engineered to function in a microgravity environment and for easy integration with the Water Recovery System. Giner will partner Johnson Space Center to ensure the ability of the sensor to detect trace metals in a range of reclaimed water samples and determine the appropriate concentrations. This sensor will detect trace heavy metals in water in near real-time, allowing for timely response and resolution to water contamination problems.

Primary U.S. Work Locations and Key Partners



Portable Sensor for Rapid In Situ Measurement of Trace Toxic Metals in Water Project Image

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California	Massachusetts
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Project Transitions

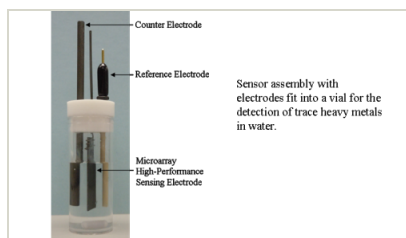
▶ **April 2012:** Project Start

✓ **January 2015:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138417>)

Images



Project Image

Portable Sensor for Rapid In Situ Measurement of Trace Toxic Metals in Water Project Image
(<https://techport.nasa.gov/image/128653>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Giner, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Badawi M Dweik

Co-Investigator:

Badawi Dweik

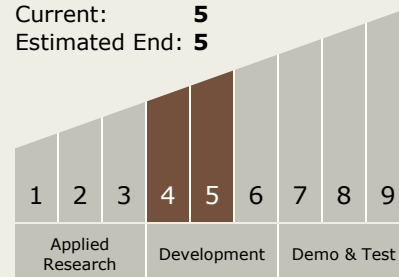
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Technology Maturity (TRL)

Start: 4
Current: 5
Estimated End: 5



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
 - └ TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System